Final Report: High Performance Correlator NASA SERC-University of New Mexico

John Canaris

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Summary

The fabrication of a high performance digital autocorrelator VLSI chip was successfully completed. The UNM-NASA SERC maintains an inventory of 30 packaged and tested correlator chips, for the Naval Research Laboratory. Additional chips are available upon the placement of an order.

There are many science applications which can use this high performance autocorrelator chip, including:

- Characterization of man-made/natural RFI in the near-earth environment
- Determine improved ionospheric models for geolocation from space
- Quantify ionospheric shielding against RFI
- Study solar and planetary bursts for astrophysics
- Plan for future radio imaging arrays in space
- Radio astronomy spectrometers
- Planetary radar decoders
- Precise pulsar timing analysis

Chip Features

The high performance digital correlator has the following features:

- Autocorrelation and Crosscorrelation
- 1024 lags
- 100 Msamples/sec

- 3 level or 2 level input
- Double Nyquist Sampling supported
- Data Blanking
- Low Power
- Integration can continue while data is output
- 50 μs readout time
- Integration periods under user control
- Chips are cascadeable
- Long integration times
- Radiation tolerant control circuitry provided

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John Canaris

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University of New Mexico - NASA SERC
Office of Research Administration
Scholes Hall 102
Albuquerque NM 87131-6003

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Naval Research Laboratory
Kurt Weiler
4555 Overlook Ave SW
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